

**Claims**

1. An assay for detecting and identifying one or more micro-organisms in a sample, characterized in that said assay comprises the use of at least two conserved molecular markers.
2. Assay according to claim 1, characterized in that said micro-organisms are bacteria.
3. Assay according to claims 1 or 2, characterized in that said assay comprises the use of at least one molecular marker that is conserved in Gram-positive bacteria and at least one molecular marker that is conserved in Gram-negative bacteria.
4. Assay according to any of claims 1 to 3, characterized in that said molecular maker that is conserved in Gram-positive bacteria is selected from the group comprising the Spy0160, Spy1372, SpyM3\_0902 and SpyM3\_0903, and Spy1527 sequences.
5. Assay according to any of claims 1 to 3, characterized in that said molecular maker that is conserved in Gram-positive bacteria is selected from the group comprising the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.
6. Assay according to any of claims 1 to 3, characterized in that said molecular maker that is conserved in Gram-negative bacteria is selected from the group comprising the Ecs0036, HI1576, EG10839 and EG11396, and HI0019 sequences.
7. Assay according to any of claims 1 to 3, characterized in that said molecular maker that is conserved in Gram-negative bacteria is selected from the group comprising the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.
8. Use of an assay according to any of claims 1 to 7 for diagnosing bacterial infection of a sample.
9. A primer pair suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5.

10. A primer pair suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria as defined in any of claims 6 or 7.
- 5    11. A nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5.
12. A nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.
- 10    13. A composition comprising at least one primer pair suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5, and at least one primer pair suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.
- 15    14. A composition comprising at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5 and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.
- 20    15. A kit for detecting and identifying one or more micro-organisms, preferably bacteria, in a sample, which comprises a composition according to claim 13 and/or claim 14.
- 25    16. A DNA chip in which at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7, is immobilized on a solid support.